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In previous investigations on the effect of isolation in a constant environment, a shift in the sleep-wakefulness cycles was demonstrated in man which was accompanied by a corresponding daily shift of about 1-2 hours in seven physiological functions, pulse rate, respiratory rate, body temperature, urinary excretion, saliva electrolyte levels, basic skin resistance, pulmonary functions (1).

A dissociation of some previously synchronized physiological functions was observed during the sixth and seventh day of isolation and during the third day of recovery.

Since bodily activity is known to have important influence on the behaviour of physiological functions, a second experiment was designed to determine the extent to which the shift in physiological functions, under free-running conditions, is dependent upon the shifting activity cycle.

One subject remained in isolation for 13 days, following a four-day control period. During the whole experiment the activity was reduced as far as possible. The subject spent most of his waking time in recumbency, while reading. He got up only for the three daily meals, the collection of samples and tests according to a rigid time schedule.

In this experiment with reduced activity, the sleep-wakefulness cycle also shifted one to two hours per day away from the local clock time. However, most of the physiological functions did not undergo a corresponding shift and maintained a rather regular pattern synchronized with the local time.

The results of this experiment demonstrated that the activity must be an important factor in inducing the characteristic pattern of free-running circadian cycles.

REFERENCE

1. Quarterly Progress Report, NASA Project R-24, October, 1964.

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